SIMTEK6469

IN THE UNITED STATES PATENT OFFICE

In re Application of
Tomitaka Yamashita

App. No.: 10/065312
Filed: 10/2/2002
Conf. No.: 7690
Title: PERMANENT MAGNET TYPE ROTARY ELECTRIC MACHINE
Examiner: Y. Comas
Art Unit: 2834

I hereby certify that this correspondence and all marked attachments are being deposited with the United States Patent Office via fax to (703) 872-9319 on:
May 16, 2005
Ernest A. Beutler
Reg. No. 19901

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

SUBSTITUTE COMPLIANT APPELLANT'S BRIEF

REAL PARTY IN INTEREST

In addition to the appellant, the real party in interest is his assignee, Kabushiki Kaisha Moric, a Japanese company.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences that would have a bearing on or be affected by the decision in this appeal.

STATUS OF CLAIMS

Claims 1 through 26 remain in this application and all are before the Board on appeal.

Only Elected Claims 1-4, 6, 9, 11, 23 and 25 are being appealed. Claims 12 and 16 have been indicated as allowable if rewritten in independent form.

STATUS OF AMENDMENTS

No amendment was filed after the Final Rejection previously the subject of the Appeal Brief filed on behalf of Appellants on September 10, 2004. In light of that Brief the Examiner has abandoned the grounds of Final Rejection previously applied and has reopened prosecution of the claims herein appealed based on new grounds of rejection. Appellants have chosen, as is their right, to proceed with the previously filed Appeal on the basis of this new Brief without any amendment to the claims. Thus all claims before the Board are in the form as now rejected. A clean copy of the claims before the Board appears in the Appendix to this Brief.

SUMMARY OF CLAIMED SUBJECT MATTER

The only appealed independent claims on appeal are claims 1 and 23 and they are reproduced below with the reference numerals applied to its claimed elements and the portion of the specification describing those elements noted.

Claim 1 (annotated). An electrically operated starter for an internal combustion engine (indicated generally at 11)(described generally at paragraph [0029]), said starter comprising a DC electrical motor having an output shaft (indicated at 17) in starting arrangement with a shaft of the engine for starting the engine upon the application of electrical power (described in paragraph [0034] , said motor being comprised of cooperating, relatively rotatable permanent magnet (indicated at 14 and described in paragraph [0029]) and selectively energized coil winding elements (not shown but described at paragraph [0031]), said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity, said coil winding element being comprised of circumferentially spaced magnetic pole cores (indicated as 19) around which electrical coils are wound, said cores having ends in facing relation to said permanent magnets, said motor having reduced vibration after the discontinuation of application of electrical power to said coil winding elements upon engine starting by at least one of reducing the cogging torque of the starter motor and rigidifying the outer housing of the starter motor (one electrical embodiment is described in paragraphs [0036-0038], electrical embodiment is described in paragraphs [0039-40] still another electrical embodiment is described in paragraphs [0041-0042], yet another electrical embodiment is described in paragraphs [0043-0044] still two more electrical embodiment is described in paragraphs [0045-0048] The mechanical embodiment is described by reference to FIGS. 11 and 12 in paragraphs [0051-0052].

Claim 23 (annotated) A rotating electrical machine of reduced cogging torque at the time after said machine is powered comprised of cooperating, relatively rotatable permanent magnet and coil winding elements (same as noted in claim 1 above), said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity (same as noted in claim 1 above) , said coil winding element being comprised of circumferentially spaced magnetic pole cores around which electrical coils are wound (same as noted in claim 1 above), said cores having ends in facing relation to said permanent magnets, the relationship between said pole cores facing ends and said permanent magnets being skewed to reduce the cogging torque of the starter motor at the time after said machine has been powered and power is no longer being applied (the electrical embodiment of FIGS. 9 and 10 described in paragraphs [0045-0048]) , each of said permanent magnets being comprised of axially spaced and circumferentially spaced but circumferentially overlapping segments to effect the skewing.

GROUND OF REJECTION TO BE REVIEWED ON APPEAL

Is the structure of Claims 23, and 26 anticipated by US Patent 6,252,323 (Nishikawa et al). under 35 USC 102(a)?

Is the structure of claims 1-4 and 6, obvious under 35 USC 103(a) from the combined teachings of newly cited US Patent 5,475,276 (incorrectly identified as 5475176 in the Rejection) (Shiga et al) in view of US Patent 5,942,873 (Nakano). This latter reference had been cited by the Examiner previously but was not applied in any previous rejection?

Is the structure of claims 9 and 11 obvious under 35 USC 103(a) from the combined teachings of Shiga et al in view of Nakano in further view of Nishikawa et al?

APPELLANT'S ARGUMENTS

There are two independent clams before the Board, these being claims 1 and 23. These two claims both have the common feature of claiming the use of the inventive structure for reducing undesirable conditions after electrical power supply to an electric motor is discontinued. Claim 1 is specific to reducing vibrations in a starter motor at this time while claim 23 claims reducing cogging torque when electrical power delivery is discontinued.

REJECTIONS OF CLAIMS 23 and 25 ON NISHIKAWA ET AL

Although the Examiner previously rejected both claims 1 and 23 on the Nishikawa et al reference he no longer applies it against claim 1 but only claim 23 and claim 25 so this rejection will be discussed first.

The reference admittedly teaches reducing cogging torque during electrical power operation, however, not after it ceases as is specifically claimed. Thus and as argued already in the description of

the invention the Board must at the outset determine if it is patentable to apply a structure, parts of which may be well known for another purpose, to serve and obtain a solution to a problem that also is well known but to which the structure has not been utilized for this new purpose. It is believed that this issue should be resolved in appellants' favor for the same reason a roller bearing would have been patentable if at the time the first cave man used a log to assist in moving a heavy rock by placing it under the rock there had been a patent system.

Contrary to the Examiner's argument that "One of ordinary skill in the art would have been motivated to do this to reduce the cogging torque of the motor", this is not what appellants have done. They have done this to reduce the cogging effect after the application of electrical power is stopped. Not the same result, but admittedly the same structure.

REJECTIONS BASED ON THE SHIGA ET AL NAKANO COMBINATION

Claim 1 is generic to both the reduction of vibrations by either of two structures one of which is the cogging method. Claim 2 stands or falls with claim 1 inasmuch as it is specific to the cogging feature. Newly cited Shiga clearly mentions vibrations, but not those occurring on stopping the application of electrical power, but those applied to the starter motor from the operation of the running engine with which it is associated. This distinction is made clear from his sentence bridging columns 1 and 2, which states "However, in the case that this type of electric rotating machine is incorporated for applications such as vehicle starter motors and used under high vibration conditions, if the tubular yoke 11 which is thin as described above is used, the rigidity is low and the yoke unit 50 will resonate with the external vibration from the engine, etc." Thus he is attempting to strengthen the construction of the starter motor to improve its resistance from external vibrations not from those caused by the slowing down of the starter motor when its operation is ceased.

The modification to employ Nakano's structure for reducing cogging during powered operation would not solve the problem sought by the basic reference. Thus it is submitted that this combination is not taught or suggested by the prior art, but constitutes an obvious attempt by the Examiner to reconstruct appellants claimed device based only on appellants own teaching not that of the combined references.

Claims 3 and 4 depend on claim 2 and calls for the cogging reduction after power cessation to be accomplished by skewing the relation between the pole core facing ends and the permanent magnet sections. Nakano admittedly shows permanent magnets that are offset circumferentially at an angle to each other. However and as discussed above the purpose is to reduce cogging under power not after it is shut off. These claims stand or fall with claim 2.

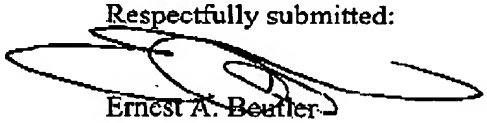
Claim 6 depends on claim 4 and further calls for the magnets to be magnetized in the direction of the axis of rotation. This is also a feature not even discussed by the Examiner because it is not shown in the Nakano reference.

REJECTIONS BASED ON THE SHIGA ET AL, NAKANO, NISHIKAWA ET AL COMBINATION

Claims 9 and 11 stand or fall together and require the Examiner to apply the Nishikawa et al teaching to the already strained Shiga et al Nakano combination. Although one skilled in the art might combine Nakano and Nishikawa et al as they are addressing similar problems neither that similar problem nor the one addressed by Shiga are that solved by appellants.

For the reasons set out, it is most respectfully submitted that the Examiner has not made out a prima facia case to support any of his rejections and a complete reversal of them is requested.

Respectfully submitted:



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APPENDIX
CLEAN COPY OF CLAIMS ON APPEAL

1. An electrically operated starter for an internal combustion engine, said starter comprising a DC electrical motor having an output shaft in starting arrangement with a shaft of the engine for starting the engine upon the application of electrical power, said motor being comprised of cooperating, relatively rotatable permanent magnet and selectively energized coil winding elements, said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity, said coil winding element being comprised of circumferentially spaced magnetic pole cores around which electrical coils are wound, said cores having ends in facing relation to said permanent magnets, said motor having reduced vibration after the discontinuation of application of electrical power to said coil winding elements upon engine starting by at least one of reducing the cogging torque of the starter motor and rigidifying the outer housing of the starter motor.

2. A starter for an internal combustion engine as set forth in claim I, wherein the motor vibrations after engine starting are reduced by reducing the cogging torque of the starter motor.

3. A starter for an internal combustion engine as set forth in claim 2, wherein the relationship between the pole cores facing ends and the permanent magnets is skewed to reduce the cogging torque of the starter motor.

4. A starter for an internal combustion engine as set forth in claim 3, wherein the permanent magnets are skewed relative to the axis of relative rotation and the pole cores are not.

6. A starter for an internal combustion engine as set forth in claim 4, wherein the edges of the permanent magnets are skewed but their magnetization is in the direction of the axis of relative rotation.

9. A starter for an internal combustion engine as set forth in claim 4, wherein each of the permanent magnets is comprised of axially spaced and circumferentially spaced but circumferentially overlapping segments.

11. A starter for an internal combustion engine as set forth in claim 9, wherein each permanent magnet is comprised of an uneven number of segments consisting of a center segment and side segments circumferentially spaced from said center segment but circumferentially overlapping said center segment.

23. A rotating electrical machine of reduced cogging torque at the time after said machine is powered comprised of cooperating, relatively rotatable permanent magnet and coil winding elements, said permanent magnet element being comprised of circumferentially spaced permanent magnets of opposite polarity, said coil winding element being comprised of circumferentially spaced magnetic pole cores around which electrical coils are wound, said cores having ends in facing relation to said permanent magnets, the relationship between said pole cores facing ends and said permanent magnets being skewed to reduce the cogging torque of the starter motor at the time after said machine has been powered and power is no longer being applied , each of said permanent magnets being comprised of axially spaced and circumferentially spaced but circumferentially overlapping segments to effect the skewing.

25. A starter for an internal combustion engine as set forth in claim 23, wherein each permanent magnet is comprised of an uneven number of segments consisting of a center segment and side segments circumferentially spaced from said center segment but circumferentially overlapping said center segment.